DRS-202E

Single phase three wire DIN Rail energy meter (Neutral bypasses meter)

Four modular

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User manual

1.1 Safety instructions

Information for Your Own Safety

This manual does not contain all of the safety measures for operation of the equipment (module, device), because special operating conditions, and local code requirements or regulations may necessitate further measures. However, it does contain information which must be read for your personal safety and to avoid material damages. This information is highlighted by a warning triangle and is represented as follows, depending on the degree of potential danger.

Warning

This means that failure to observe the instruction can result in death, serious injury or considerable material damage.

Caution

This means hazard of electric shock and failure to take the necessary safety precautions will result in death, serious injury or considerable material damage.

Qualified personnel

Operation of the equipment (module, device) described in this manual may only be performed by qualified personnel. Qualified personnel in this manual means person who are authorized to commission, start up, ground and label devices, systems and circuits according to safety and Regulatory standards.

Use for the intended purpose

The equipment (device, module) may only be used for the application specified in the catalogue and the user manual, and only be connected with devices and components recommended and approved by Forlong.

Proper handling

The prerequisites for perfect, reliable operation of the product are proper transport, proper storage, installation and assembly, as well as proper operation and maintenance. When operating electrical equipment, certain parts of this equipment automatically carry dangerous voltages. Improper handling can therefore result in serious injuries or material damage.

- ✧ Use only insulating tools.
- ✧ Do not connect while circuit is live (hot).
- ✧ Do not connect the meter to a 3 phase - 400VAC – network.
- ✧ Place the meter only in dry surroundings.
- ✧ Do not mount the meter in an explosive area or expose the meter to dust, mildew and insects.
- ✧ Make sure the used wires are suitable for the maximum current of this meter.
- ✧ Make sure the AC wires are connected correctly before activating the current/voltage to the meter.
- ✧ Do not touch the meter connecting clamps directly with your bare hands, with metal, blank wire or other material as you will have the chance of an electrical shock.
- ✧ Make sure the protection cover is placed after installation.
- ✧ Installation, maintenance and reparations should only be done by qualified personnel.
- ✧ Never break the seals and open the front cover as this might influence the functionality of the meter, and will avoid any warranty.
- ✧ Do not drop, or allow physical impact to the meter as there are high precision components inside that may be damaged.

Disclaimer

We have checked the contents of this publication and every effort has been made to ensure that the descriptions are as accurate as possible.

However, deviations from the description cannot be completely ruled out, so that no liability can be accepted for any errors contained in the information given. The data in this manual is checked regularly and the necessary corrections are included in subsequent editions. We are grateful for any improvements that you suggest.

Subject to technical modifications without notice.

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1.2 Foreword

Thank you for purchasing the Forlong DRS-202E DIN rail single phase three wire energy meter. DRS-202E energy meter is suit for standard North American household current. Generally a white neutral, a black and a red live wire, 168V to 312V between the two live wires, 84V to 156V between live and neutral wire.

Besides the normal energy meters we also developed our own pre-paid meters with chip card, chip card re-loaders and a complete PC management control system. For more information on other product please contact our sales department at sale02@china-meters.com

Although we produce the Forlong DRS-202E meter according to IEC 62053-21 and our quality inspection is very accurate there might always be a possibility that your product shows a fault or failure for which we do apologize. Under normal conditions your product should give you years of benefit and pleasure. In case there is a problem with the energy meter you should contact your dealer immediately. All energy meters are sealed with a special seal. Once this seal is broken there is no possibility to claim for warranty. Therefore NEVER open an energy meter or break the seal of the energy meter. The warranty time is 6 months, after installation, and only valid for construction faults.

1.3 Performance criteria:

Operating humidity	≤ 75%
Storage humidity	≤ 95%
Operating temperature	-10°C - +50°C
Storage temperature	-30°C - +70°C
International standard	IEC 62053-21
Accuracy class	1
Protection against penetration of dust and water	IP51
Insulating encased meter of protective class	II

1.4 Specifications:

Meter type		DRS-202E(LCD display)
Nominal voltage	(Un)	L1-N 120V AC
		L2-N 120V AC

Operational voltage	L1-L2 240V AC L1-N 84 ～156V AC L2-N 84 ～156V AC L1-L2 168 ～312V AC
Insulation capabilities:	
- AC voltage withstand	2KV for 1 minute
- Impulse voltage withstand	6KV – 1.2μS waveform
Basic current (Ib)	1.5A/5A/10A
Maximum rated current (Imax)	6A/60A/100A
Operational current range	0.4% Ib- Imax
Over current withstand	30Imax for 0.01s
Operational frequency range	50～60Hz ±10%
Internal power consumption	≤2W / 10VA
Test output flash rate (RED LED)	800imp/kWh
Pulse output rate (pins 5 & 6)	800imp/kWh
reverse indicator (RED LED)	Current reverse
Consumption indicator (RED LED)	Flashing at load running

1.5 Basic errors:

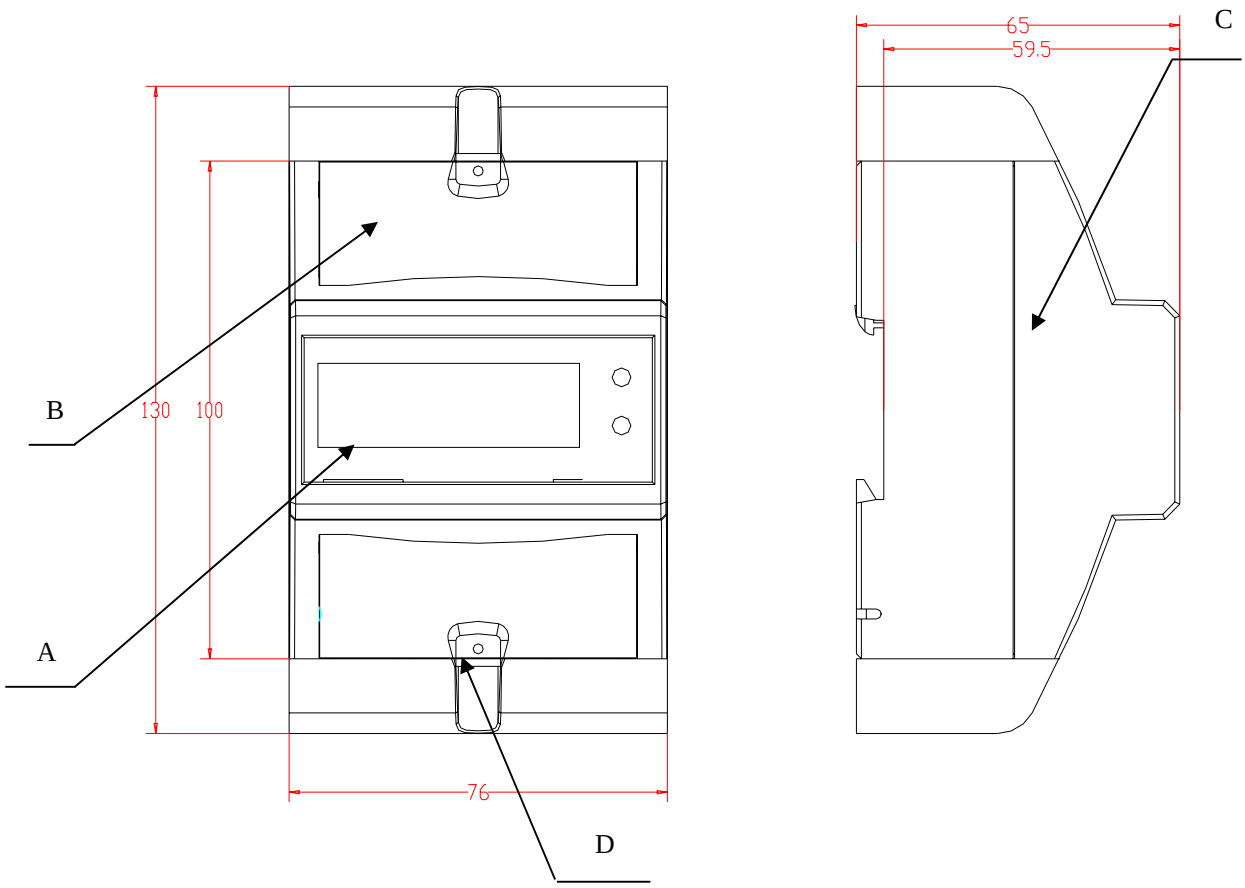
0.05Ib	Cosφ = 1	±1.5%
0.1Ib	Cosφ = 0.5L	±1.5%
	Cosφ = 0.8C	±1.5%
0.1Ib - Imax	Cosφ = 1	±1.0%
0.2Ib - Imax	Cosφ = 0.5L	±1.0%
	Cosφ = 0.8C	±1.0%

1.6 Description

A	Front panel
B	Cover
C	Base
D	Security hasp

Material

Front panel	PC inflammable retarding
Cover	ABS inflammable retarding
Base	ABS inflammable retarding



1.7 Dimensions

Height	130 mm
Width	76 mm
Depth	65 mm
Max diameter cable	11.5 mm (7.5mm with adaptor 1 and 4.9mm with adaptor 2)
Weight	0.4 Kg (net)

1.8 Installation

⚠ CAUTION
♦ Turn off all the power before working on it. ♦ Always use a properly rated voltage sensing device to confirm that power is off.

⚠ WARNING

- Installation should be performed by qualified personnel familiar with applicable codes and regulations.
- Use isolated tools to install the meter.
- Fuse or thermal cut-off or single-pole circuit breaker can't be fitted on the supply line and not the neutral line.
- Don't put your finger into the hole, because there is a screw inside.
- Please choose the available adapter which is supplied with the meter to suit the diameter of the cable.

- ✧ We recommend that the connecting wire which is used to connect the meter to the outside circuit should be sized according to local codes and regulations for the amp city of the circuit breaker or over current device used in the circuit.
- ✧ An external switch or a circuit-breaker should be installed on the inlet wire, which will be used as a disconnection device for the meter. And there it is recommended that the switch or circuit-breaker is near the meter so that it is more convenience for the operator. The switch or circuit-breaker should comply with the specifications of the building electrical design and all local regulations.
- ✧ An external fuse or thermal cut-off which will be used as a over-current protection device for the meter must be installed on the supply side wire, and it is recommended that the over-current protection device is near the meter so that it is more convenience for the operator. The over-current protection device should comply with the specifications of the buildings electrical design and all local regulations.
- ✧ This meter can be installed indoor directly, or in a meter box which is waterproof outdoor, subject to local codes and regulations.
- ✧ To prevent tampering, secure the meter with a padlock or a similar device.
- ✧ The meter has to be installed against a wall which is fire resistant.
- ✧ The meter has to be installed in a good ventilated and dry place.
- ✧ The meter has to be installed in a protection box when placed in dangerous or dusty environment.
- ✧ The meter can be installed and used after being tested and sealed with a letter press printing.
- ✧ The meter can be installed on a 35mm DIN rail or direct on a meter board with screws.
- ✧ The meter should be installed in an available height so that it is easy to read.
- ✧ When the meter is installed in an area with frequent surges due to e.q. thunderstorms, welding machines, inverters etc, protect the meter with Surge Protection Devices.
- ✧ After installation, the meter must be sealed to prevent tampering.

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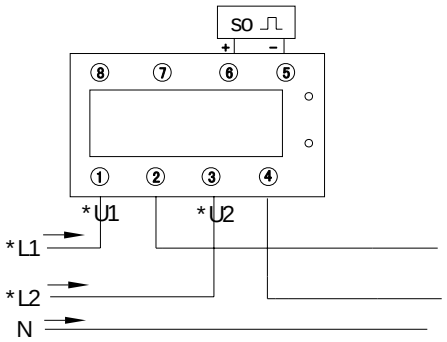
Connection of the wires should be done in accordance with the underneath connection diagram.



1	L1	In/PHASE1
2	L1	OUT
3	L2	In/PHASE2
4	L2	OUT
5 and 6	Test pulse output contact	

1.9 Operating

Consumption indication

There is a red LED which is used as indicating power consumption in the front panel of DRS-202E . When consumption happens, the LED will flash. The more quickly LED flashes, the more consumption there is. For this LED, the flash rate is indicated per kWh on the front panel

Reverse indication

There is a red LED which is used as indicating current reverse in the front panel

Reading the meter

The DRS-202E energy meter is equipped with 6+1 or 5+2 LCD display. which is used as recording consumption and can't be reset to zero. The number system is based on units of 10. And unit is kWh.

Pulse output

The DRS-202E DIN rail energy meter is equipped with a pulse output which is fully separated from the inside circuit. That generates pulses in proportion to the measured energy for accuracy testing. The pulse output is a polarity dependant, passive transistor output requiring an external voltage source for correct operation. For this external voltage source, the voltage (Ui) should is 5-27V DC, and the maximum input current (Imax) is 27mA DC. To connect the impulse output, connect 5-27V DC to connector 6 (anode), and the signal wire (S) to connector 5 (cathode). The meter pulses is indicated on the front panel.

1.10 Troubleshooting

⚠ CAUTION
• During reparation and maintenance, do not touch the meter connecting clamps directly with your bare hands, with metal, blank wire or other material as you will have the chance of an electricity shock and a possible chance for health damage. • Turn off and lock out all power supplying the energy meter and the equipment to which it is installed before opening the protection cover to prevent the hazard of an electric shock.

⚠ WARNING
• Maintenance or reparations should be performed by qualified personnel familiar with applicable codes and regulations. • Use insulated tools to maintain or repair the meter. • Make sure the protection cover is in place after maintenance or repair.

Problem	Check	Solution
No light for the consumption indicator (RED LED).	Is the load running ? Is the operating power too low ? Maybe there is a fault in the inside circuit.	Only when load is running, this LED will flash. If the operating power is too low, the spacing interval of the flashes will take some more time. This is why it seems that LED is not burning Please contact your technical supporter to replace this meter.
The register can't run.	Is the load running ? Is the operating power too low ? Maybe there is a fault in the inside circuit.	Only when load is running, RED LED is burning continue, the register will run. If the operating power is too low, the spacing interval of the pulses will take some more time. This is why it seems like the meter won't count Please contact your technical supporter to replace this meter.
No pulse output.	Is DC power supply connected to the meter ? Is the connecting correct ? Maybe there is a fault in the inside circuit.	Check the external voltage source (Ui) is 5-27V DC. Check correct connecting: Connect 5-27V DC to connector 3 (anode), and the signal wire (S) to connector 2 (cathode). Please contact your technical supporter to replace this meter.
Pulse output rate wrong.	Maybe there is a fault in the inside circuit.	Please contact with technical supporter to replace this meter.

1.11 Technical support

Any questions, please contact:

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Email: sale01@china-meters.com

www.china-metes.com